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(54) IMPROVEMENTS IN OR RELATING TO ROOFS

(71) We, BARTOL PLASTICS LIMITED, a British Company, of Edlington Lane, Edlington, Doncaster, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to roofs and in particular to sealing round a soil pipe or vent pipe passing through a roof, as is becoming increasingly prevalent with the adoption of inside plumbing.

According to the present invention, means for use in sealing round a soil pipe or vent pipe passing through a roof comprises a metal sheet with a hole, and an elastomeric sleeve with one end united to the sheet metal around the hole, the other end of the elastomeric sleeve being formed with a smaller internal diameter than the hole in the metal sheet.

The metal sheet is intended for incorporation in a roof and the elastomeric sleeve is adapted to seal round a soil pipe or vent pipe having an outside diameter less than the hole in the metal sheet and greater than the internal diameter of the other end of the elastomeric sleeve.

The elastomeric sleeve may have a frusto-conical form the larger end of which is united to the sheet metal, and the axis of the elastomeric sleeve may be inclined with respect to the plane of the metal sheet, whereby the metal sheet is suitable for incorporation in a sloping roof, through which a vertical soil pipe or the like passes, and the smaller end of the sleeve preferably lies in a plane perpendicular to the axis of the sleeve. Alternatively, the elastomeric sleeve may have a bellows formation to facilitate accommodation to a variety of angles of inclination of roof.

A formation of the sheet metal around the hole may provide an interface between the metal and the elastomeric material considerably greater in area than the adjoining cross-sectional area of the sleeve, and may be a frusto-conical portion corresponding to the larger end of the elastomeric sleeve. The frusto-conical portion may be disposed at the outside or the inside of the elastomeric sleeve, or it may be disposed in the thickness of the elastomeric sleeve, in which case it may be provided with holes or slots into or through which the elastomeric material extends to lock the sleeve to the metal sheet. Alternatively, the formation around the hole may be a lip turned away from the hole and spaced from the sheet so as to lock into the larger end of the elastomeric sleeve.

The metal sheet can be incorporated in a roof in a variety of ways depending upon the roof construction. Thus it may take the place of a slate or tile, or similar roofing slab, or it may be disposed between overlapping slates or tiles or between layers of a composite roof construction. Conveniently, the metal is aluminium (or aluminium alloy) or lead as this facilitates the moulding of a formation around the hole to which the elastomeric sleeve is bonded, or otherwise united, and also facilitates the bending, shaping and/or trimming of the sheet on site to fit a wide variety of roof constructions and unit sizes, but it is generally convenient to use metal sheets in standard sizes, square and/or rectangular.

The elastomeric sleeve may be moulded and then bonded to the metal sheet by a suitable bonding agent, or it may be moulded on the metal sheet, especially in the cases where the formation around the hole enters the elastomeric material, and a suitable bonding agent may be applied to the sheet metal in the region of the formation of the hole before moulding on the sleeve. Suitable materials for the elastomeric sleeve are synthetic rubber (e.g., styrene butadiene or neoprene) and a chemical bonding agent (e.g., chlorinated rubber resin or a rubber isocyanate mixture).

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The smaller end of the sleeve may be provided with one or more internal ribs or lips, for effecting the actual sealing round a soil pipe or the like pushed through it.

Two embodiments of the invention and a number of modifications applicable to either embodiment will now be described, by way of example only, with reference to the accompanying drawings, in which:—

Figure 1 is a plan of one embodiment of the invention;

Figure 2 is an underneath plan of the embodiment of Figure 1;

Figure 3 is an enlarged fragmentary section taken from the line III—III of Figure 1;

Figures 4 and 5 are similar sections showing the embodiment of Figures 1 to 3 in use in sealing round soil pipes or vent pipes of two different diameters passing through a roof;

Figure 6 is a fragmentary perspective view corresponding to Figure 5;

Figure 7 corresponds to Figure 3 but shows another embodiment of the invention; and

Figures 8 to 10 are enlarged fragmentary sections showing alternative ways of uniting the elastomeric sleeve of Figures 1 to 6 or Figure 7 to the metal sheet.

In Figures 1 to 3, means for use in sealing round a soil pipe or vent pipe passing through a roof (as will be described presently with reference to Figures 4 to 6) comprises a metal (e.g., aluminium sheet 1 with a hole 2, and a frusto-conical elastomeric sleeve 3 with its larger end 4 united to the sheet metal around the hole, the smaller end 5 of the sleeve having a smaller internal diameter than the hole in the metal sheet. The axis A—B of the sleeve 3 is inclined with respect to the plane of the metal sheet, whereby the metal sheet is suitable for incorporation in a sloping roof (see Figures 4 to 6) through which a vertical soil pipe or the like passes, and the smaller end 5 of the sleeve lies in a plane perpendicular to the axis of the sleeve. The smaller end of the sleeve is provided with an internal rib 6 for effecting the actual sealing round a soil pipe or the like pushed through it, external stiffening ribs 7, 8 being provided at respectively the smaller end 5 and an intermediate position generally nearer the smaller end than the larger end 4. A frusto-conical formation or portion 9 of the sheet metal around the hole 2 provides an interface between the metal and the elastomeric material considerably greater than the adjoining cross-sectional area of the sleeve 3, the frusto-conical portion 9 being disposed at the inside of the elastomeric sleeve 3, which are united by a suitable bonding agent applied to the sheet metal before moulding on the sleeve.

In Figures 4 to 6 the metal sheet 1 is disposed between overlapping tiles 10 of a sloping roof, one of the tiles being cut or broken away at 11 to accommodate the sleeve 3 and (within the sleeve) a vertical soil pipe or vent pipe 12 having an outside diameter less than the hole 2 in the metal sheet (and the portion 9 round the hole) and greater than the other end 5 of the elastomeric sleeve. In Figure 4 the pipe 12 is the smallest size (say 3" inside diameter) of pipe that the pipe sealing means, 1, 3 can seal around. Although the pipe 12 in Figure 5 is by no means the largest size of pipe that the sealing means 1, 3 can accommodate, the size indicated (say 4" inside diameter) is particularly suitable since the rib 8 limits the distending of the elastomeric sleeve 3 by the pipe to the upper part of the sleeve, whereby a neat external appearance results. Figure 6 shows how the metal sheet 1 has been bent to fit corrugations 13 of the tiles 10.

In Figure 7 the elastomeric sleeve 3 has a bellows formation, to facilitate accommodation to a variety of angles of inclination of roof. Otherwise the pipe sealing means 1, 3 of Figure 7 is similar to that of Figures 1 to 3 except for the absence of the intermediate external rib 8.

In Figure 8 the frusto-conical portions 9 of the sheet metal is disposed in the thickness of the elastomeric sleeve 3, likewise in Figure 9, but in this case the portion 9 is provided with holes or slots 14 through which the elastomeric material extends to lock the sleeve 3 to the metal sheet 1. In Figure 10 a lip 15 around the hole 2 is turned away from the hole and spaced from the metal sheet 1 so as to lock into the larger end 4 of the elastomeric sleeve 3.

WHAT WE CLAIM IS:—

1. Means for use in sealing round a soil pipe or vent pipe passing through a roof comprising a metal sheet with a hole, and an elastomeric sleeve with one end united to the sheet metal around the hole, the other end of the elastomeric sleeve being formed with a smaller internal diameter than the hole in the metal sheet.

2. Pipe sealing means as in Claim 1, wherein the elastomeric sleeve has a frusto-conical form the larger end of which is united to the sheet metal.

3. Pipe sealing means as in Claim 2, wherein the axis of the elastomeric sleeve is inclined with respect to the plane of the metal sheet.

4. Pipe sealing means as in Claim 3, wherein the smaller end of the sleeve lies in a plane perpendicular to the axis of the sleeve.

5. Pipe sealing means as in Claim 1, wherein the elastomeric sleeve has a bellows formation.

6. Pipe sealing means as in any one of the preceding Claims, wherein a formation of

the sheet metal around the hole provides an interface between the metal and the elastomeric material considerably greater in area than the adjoining cross-sectional area of the sleeve.

7. Pipe sealing means as in Claim 6, wherein the formation of the sheet metal around the hole is a frusto-conical portion corresponding to the larger end of the elastomeric sleeve.

8. Pipe sealing means as in Claim 7, wherein the frusto-conical portion is disposed at the outside of the elastomeric sleeve.

9. Pipe sealing means as in Claim 7, wherein the frusto-conical portion is disposed at the inside of the elastomeric sleeve.

10. Pipe sealing means as in Claim 7, wherein the frusto-conical portion is disposed in the thickness of the elastomeric sleeve.

11. Pipe sealing means as in Claim 10, wherein the frusto-conical portion is provided with holes or slots into or through which the elastomeric material extends to lock the sleeve to the metal sheet.

12. Pipe sealing means as in Claim 6, wherein the formation of the sheet metal around the hole is a lip turned away from the hole and spaced from the sheet so as to lock into the larger end of the elastomeric sleeve.

13. Pipe sealing means as in any one of the preceding Claims, wherein the metal is aluminium or lead.

14. Pipe sealing means as in any one of the preceding Claims, wherein the elastomeric sleeve is formed of synthetic rubber and a chemical bonding agent.

15. Pipe sealing means as in any one of the preceding Claims, wherein the smaller end of the sleeve is provided with one or more internal ribs or lips.

16. Means for use in sealing round a soil pipe or vent pipe passing through a roof substantially as hereinbefore described with reference to Figures 1 to 3 of the accompanying drawings.

17. Means for use in sealing round a soil pipe or vent pipe passing through a roof substantially as hereinbefore described with reference to Figure 7 of the accompanying drawings.

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1355517 COMPLETE SPECIFICATION

2 SHEETS *This drawing is a reproduction of the Original on a reduced scale*

Sheet 1

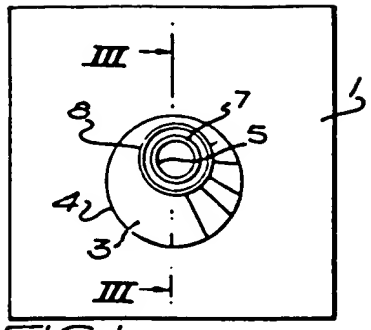

FIG.1

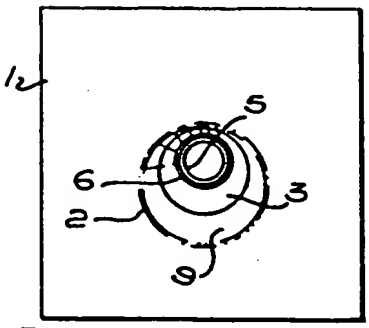

FIG.2

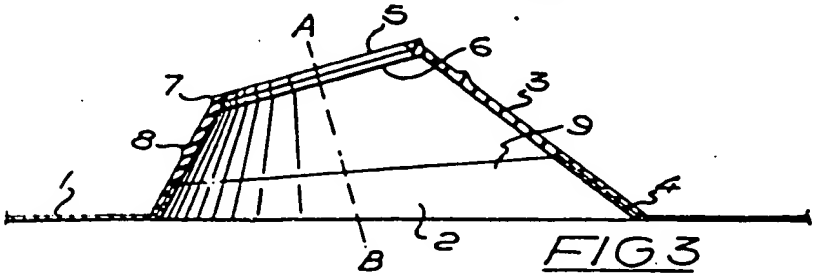

FIG.3

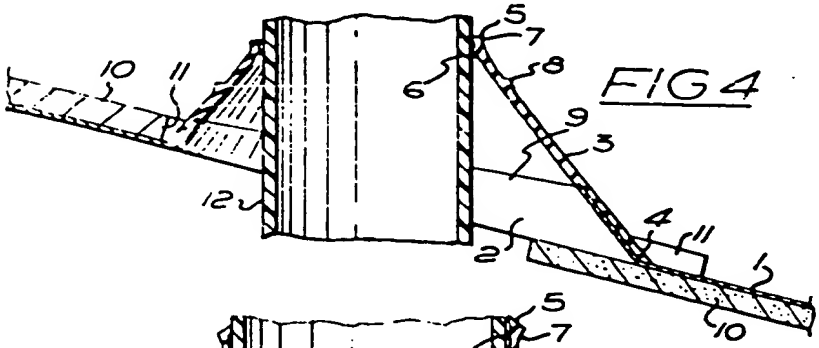

FIG 4

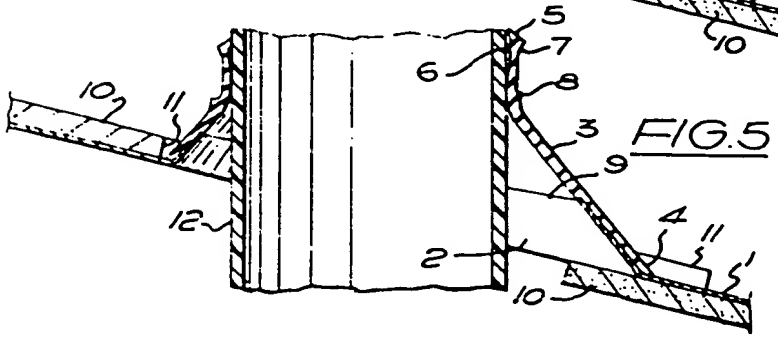

FIG.5

1355517 COMPLETE SPECIFICATION
2 SHEETS *This drawing is a reproduction of the Original on a reduced scale*
Sheet 2

FIG.6

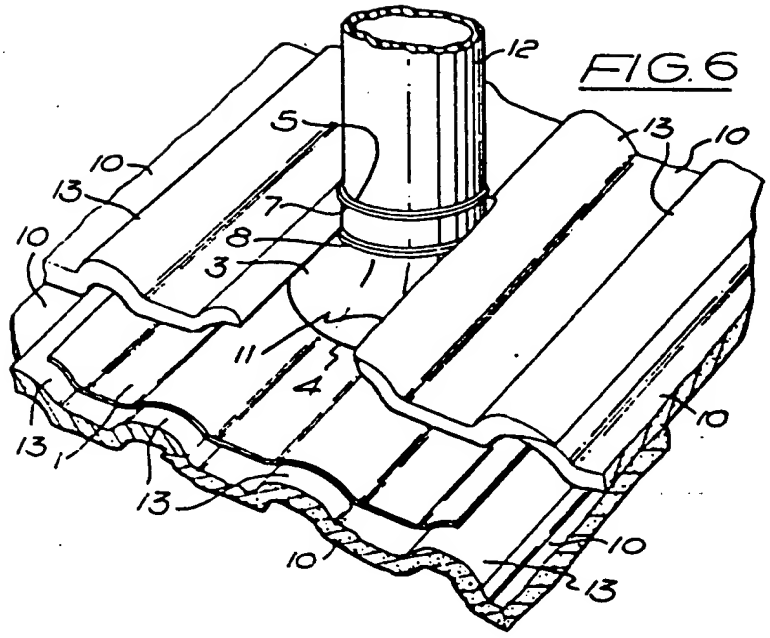

FIG 7

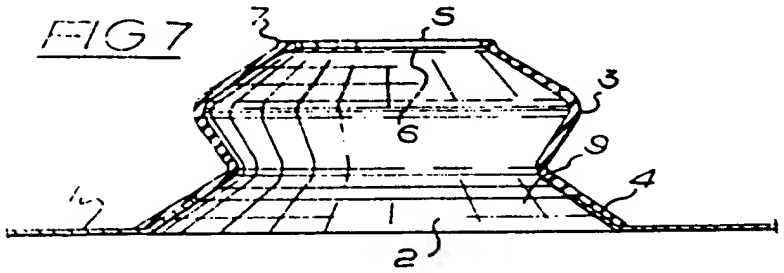

FIG8

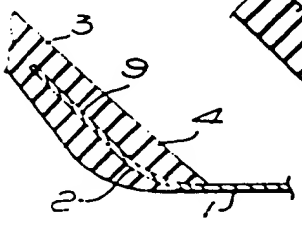

FIG.9

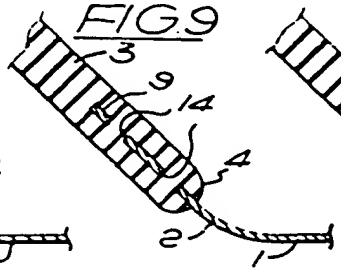

FIG.10